

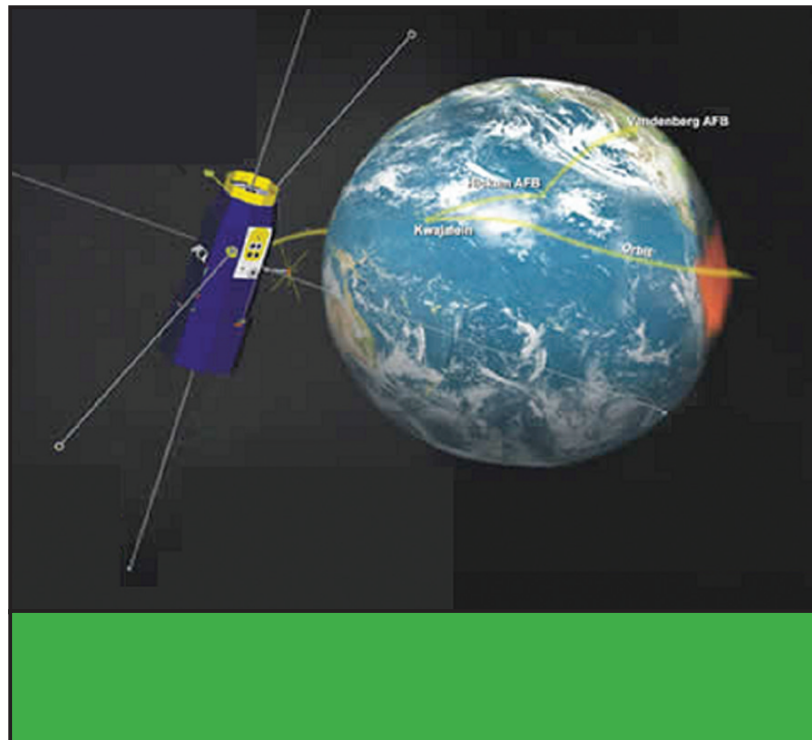


# Air Force Research Laboratory | AFRL

*Science and Technology for Tomorrow's Aerospace Forces*

## Success Story

### SIX-INSTRUMENT PAYLOAD DESIGNED FOR COMMUNICATION/NAVIGATION OUTAGE FORECASTING SYSTEM SATELLITE



The Space Vehicles Directorate recently completed the preliminary design of a six-instrument payload for the Communication/Navigation Outage Forecasting System (C/NOFS) satellite. This will be the first payload capable of making the full set of equatorial ionospheric measurements needed to understand and forecast naturally occurring ionospheric scintillations that cause satellite communication and navigation outages.



Air Force Research Laboratory  
Wright-Patterson AFB OH

Space Vehicles  
Emerging Technologies

## **Accomplishment**

The C/NOFS payload consists of six instruments designed to probe the onset of scintillation activity through various ionospheric measurement techniques from a low-altitude, low-inclination satellite platform. Directorate researchers will input payload data into scientifically based models to generate real-time nowcasts, 1-3 hr scintillation warnings, and 4+ hr scintillation forecasts. The C/NOFS will revisit nearly the same portion of the equatorial ionosphere every 90 min to validate forecasts and observe the progress of known scintillating regions.

## **Background**

The directorate is conducting the C/NOFS program to demonstrate a brand new capability to forecast communication and navigation outages caused by ionospheric scintillation. Scintillation is a major problem because it impacts the performance of systems with radio wave links to space ( $< 2.5$  GHz) and no reliable way exists to forecast when or where it will occur.

The directorate is currently developing the instrument payload, physics-based forecasting models, and a data processing center for product generation and dissemination. The directorate will transition the C/NOFS capability to military communication operators and other functional users at the completion of the Advanced Concept Technology Demonstration evaluation phase. The Space Test Program is providing the C/NOFS spacecraft, launch vehicle/service, and the first year of on-orbit operations.

## **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (01-VS-02)